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PATENT & TRADEMARK OFFICE

FIG.1-1-A

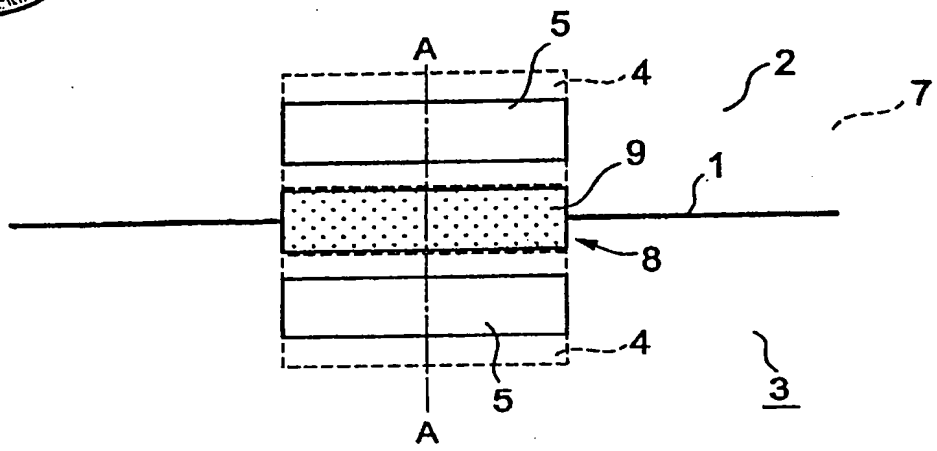
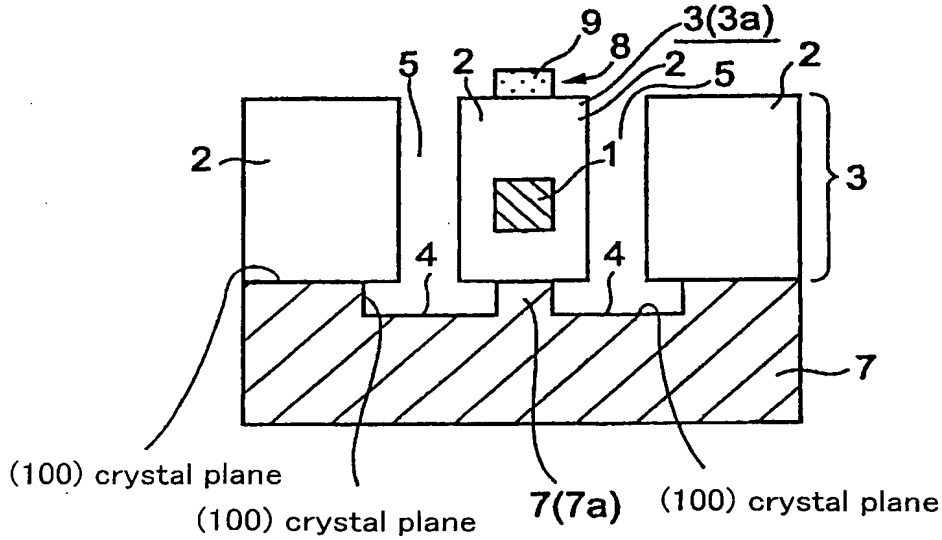


FIG.1-1-B



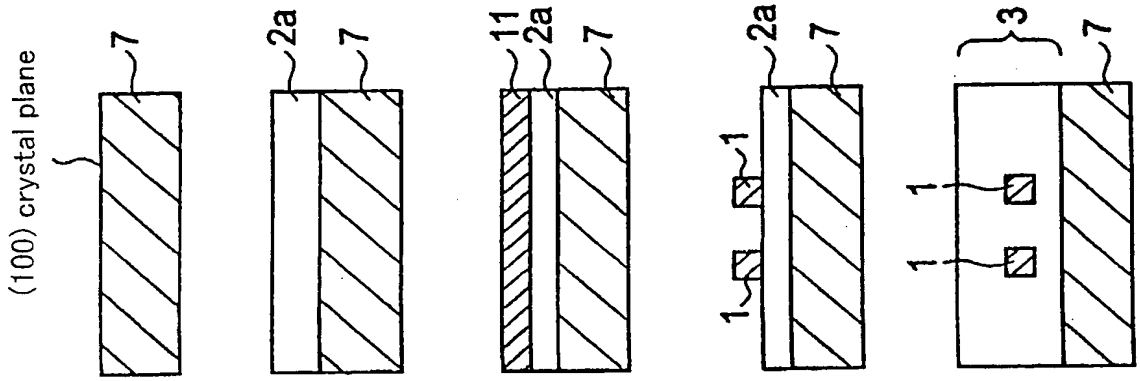


FIG.1-2-A

FIG.1-2-B

FIG.1-2-C

FIG.1-2-D

FIG.1-2-E

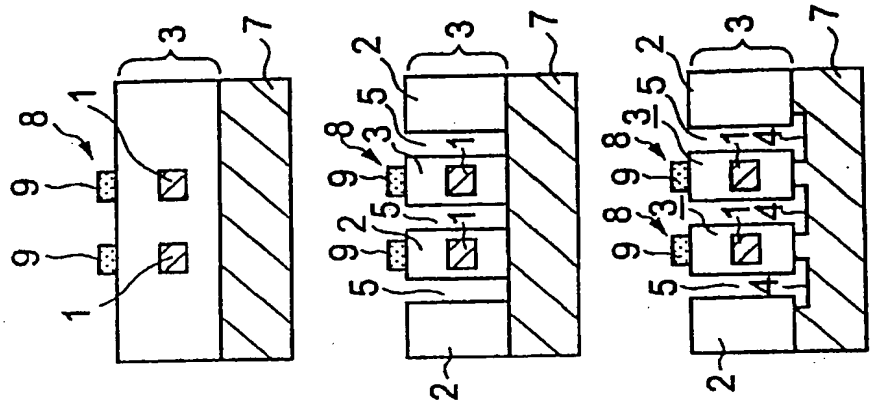


FIG.1-2-F

FIG.1-2-G

FIG.1-2-H

FIG.1-3-A

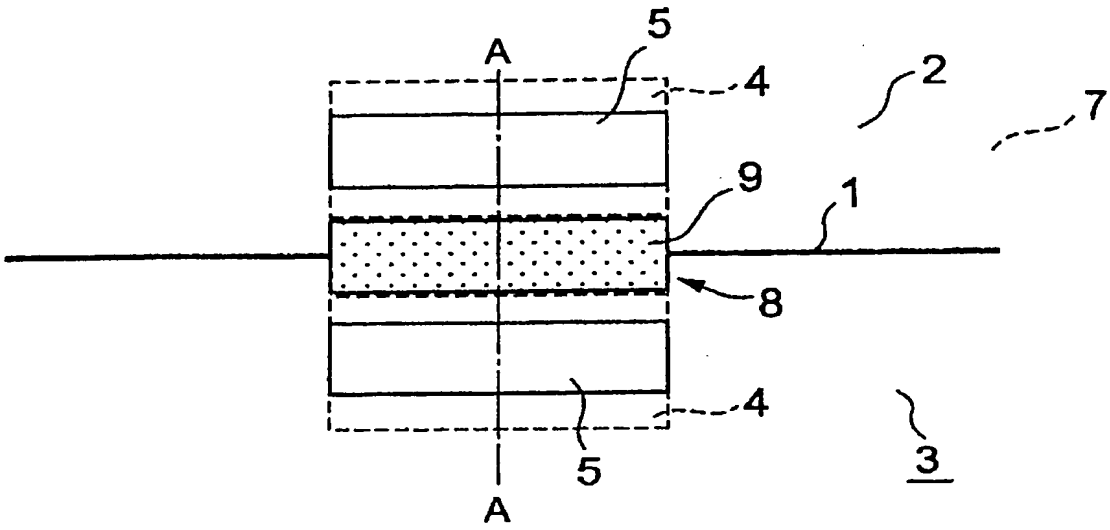


FIG.1-3-B

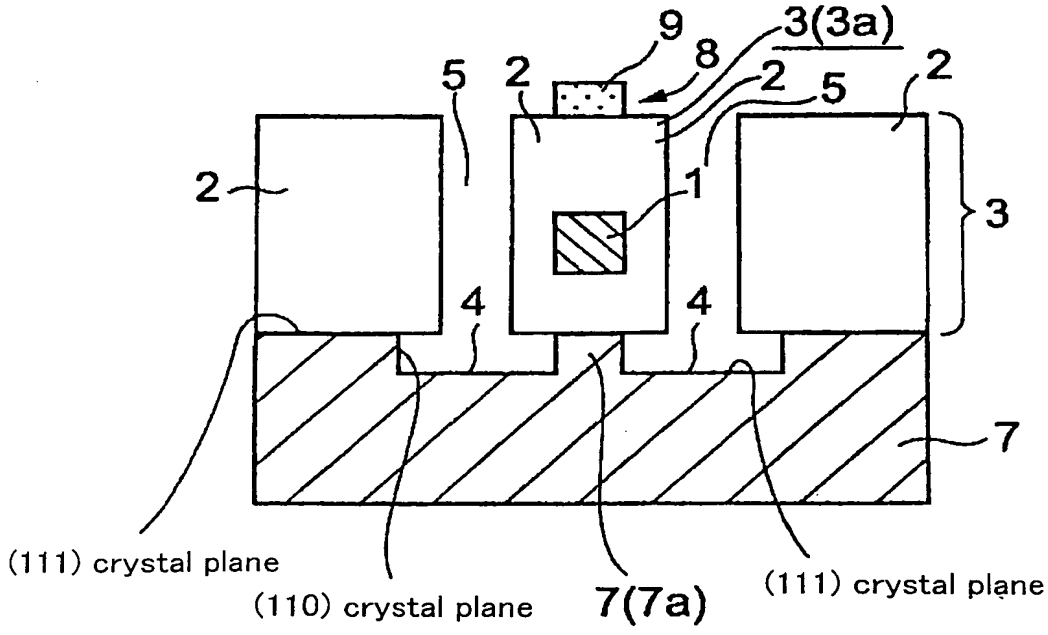


FIG.1-4-A

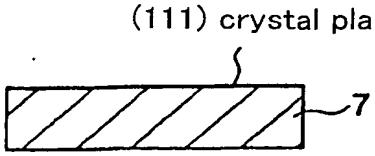


FIG.1-4-B

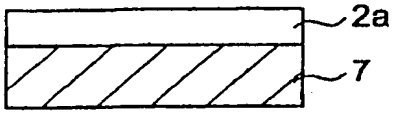


FIG.1-4-C

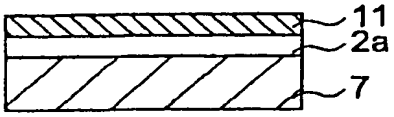


FIG.1-4-D

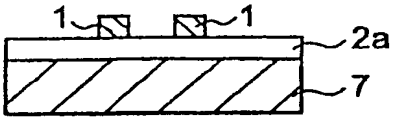


FIG.1-4-E

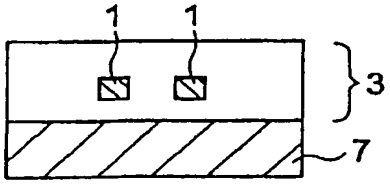


FIG.1-4-F

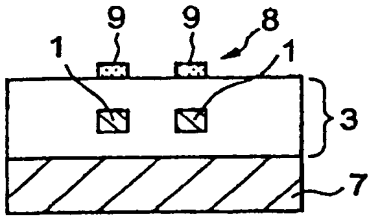


FIG.1-4-G

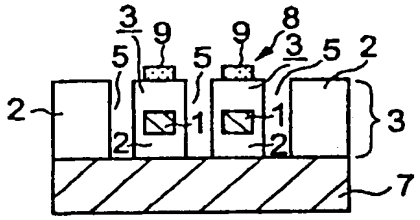


FIG.1-4-H

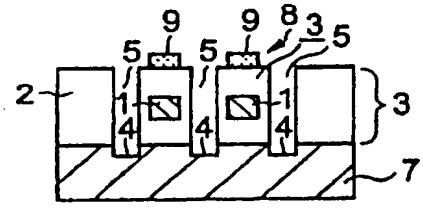


FIG.1-4-I

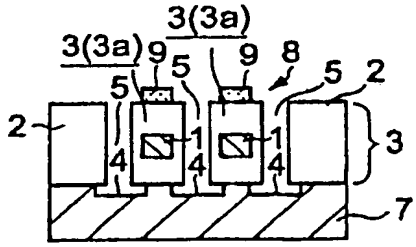


FIG.1-5-A

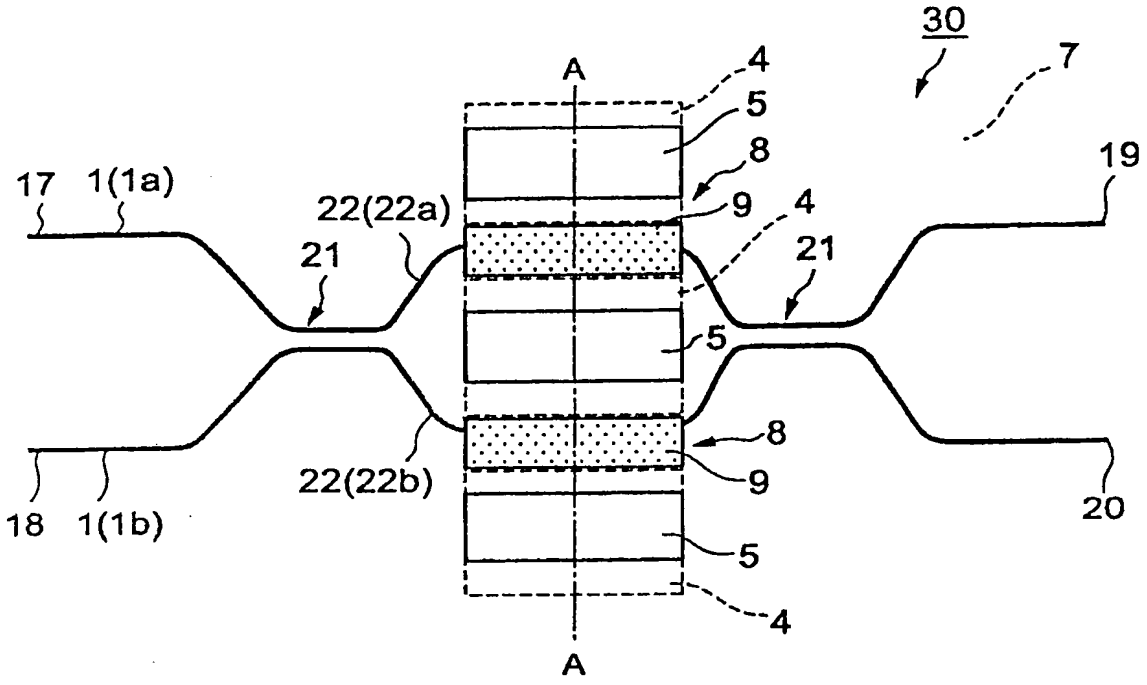


FIG.1-5-B

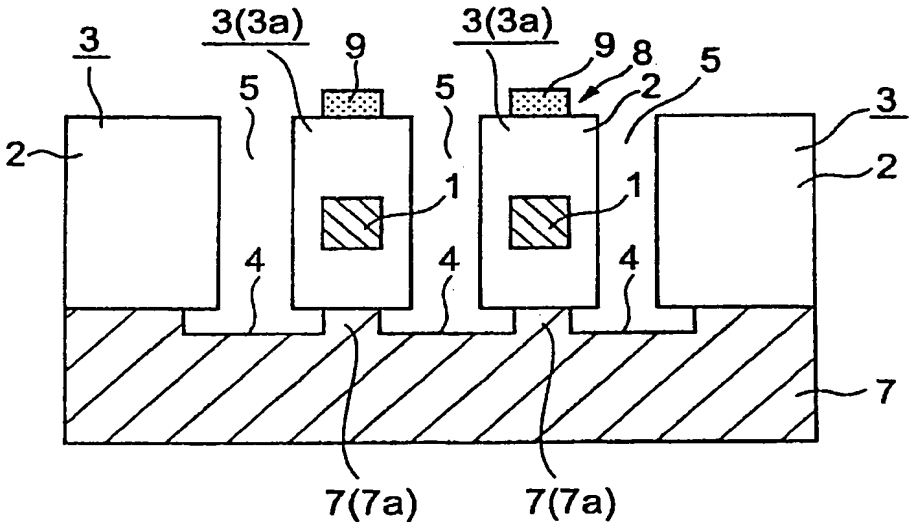


FIG.1-6-A

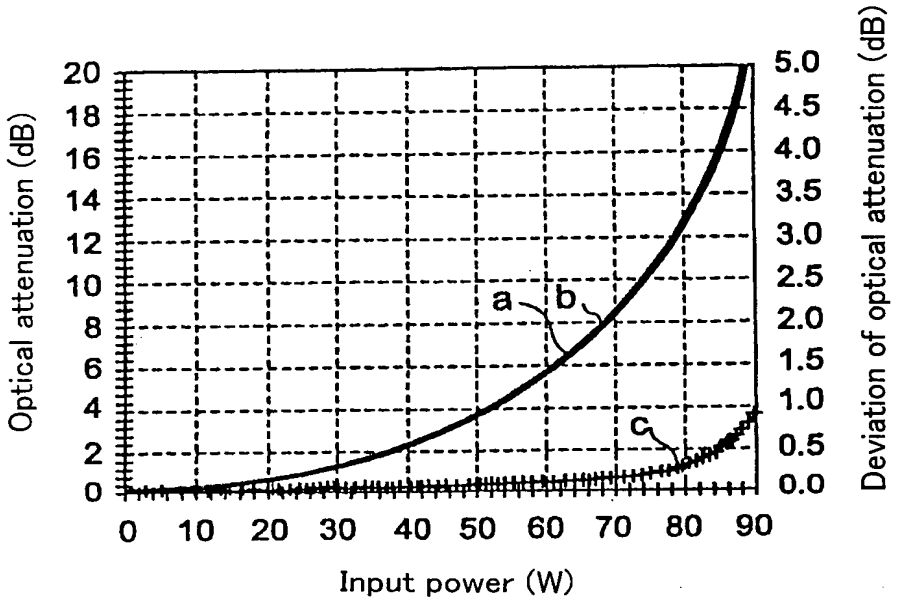


FIG.1-6-B

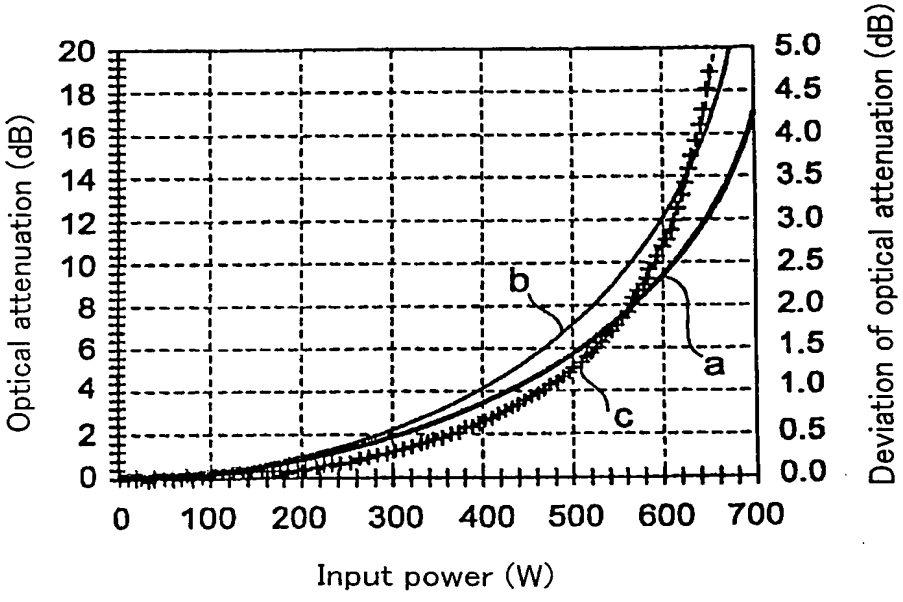


FIG.1-7

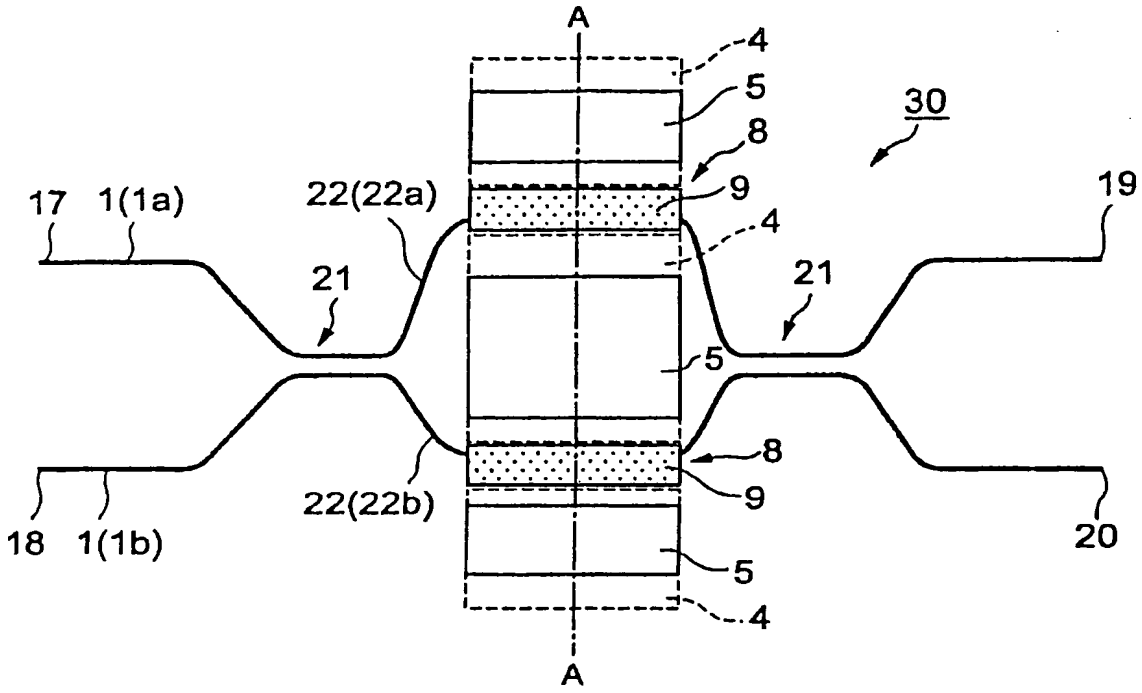

A
4
5
8
30
9
19
17
1(1a)
22(22a)
4
21
21
5
8
9
22(22b)
18
1(1b)
20
5
4
A

FIG.1-8

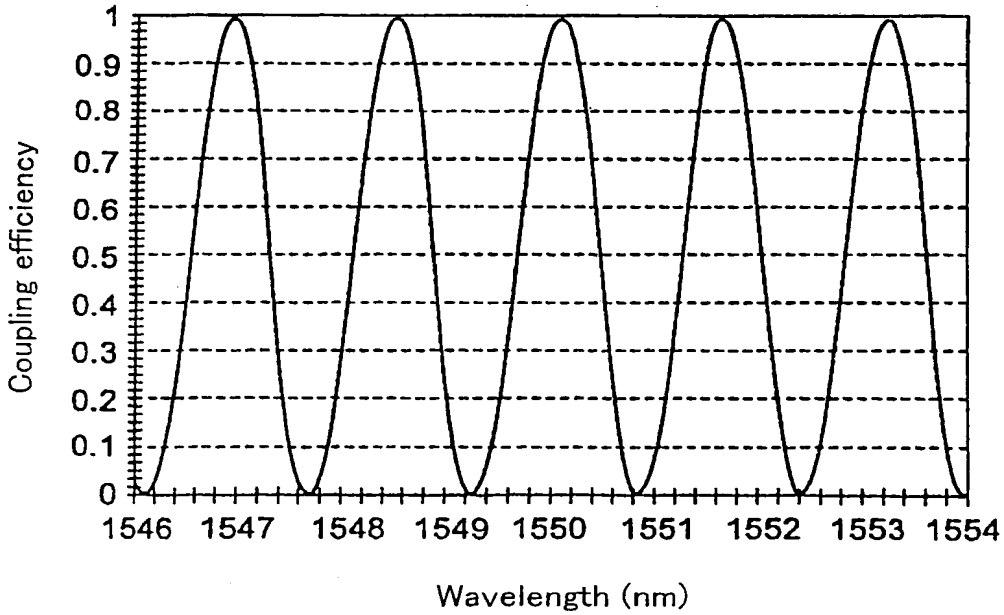

1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Coupling efficiency
1546
1547
1548
1549
1550
1551
1552
1553
1554
Wavelength (nm)

FIG.1-9

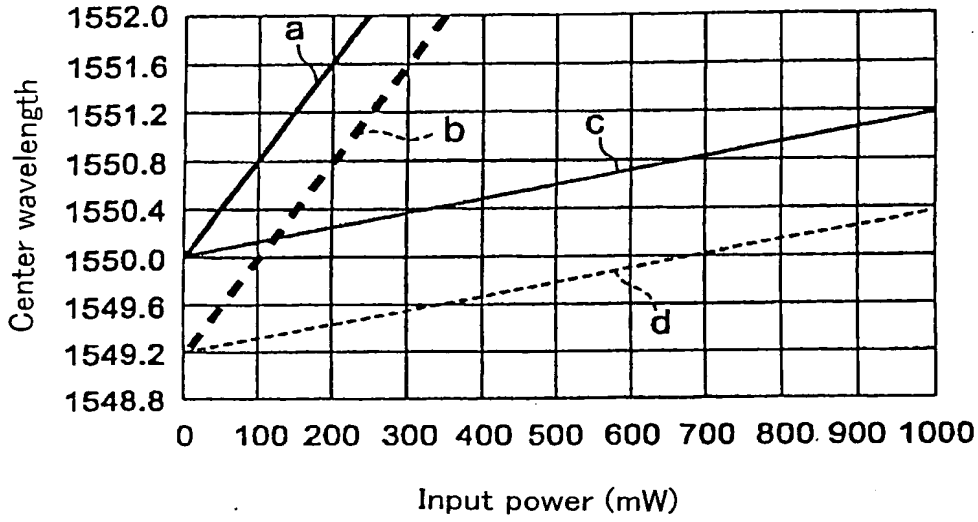


FIG.1-10

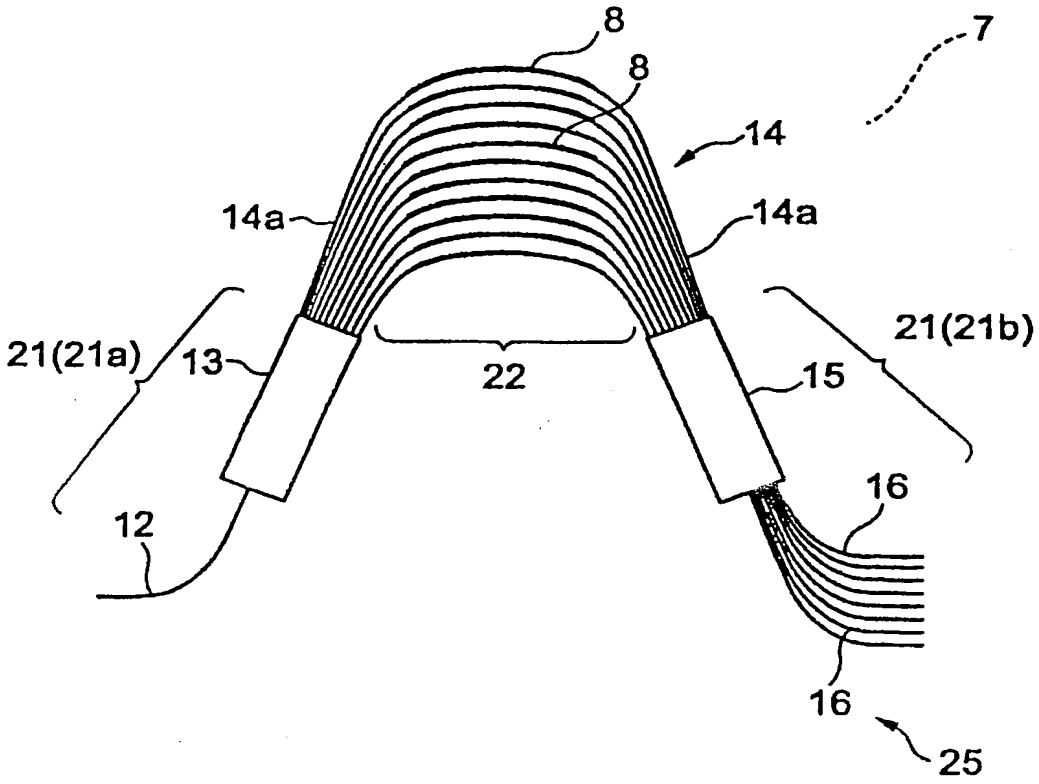


FIG.1-11-A

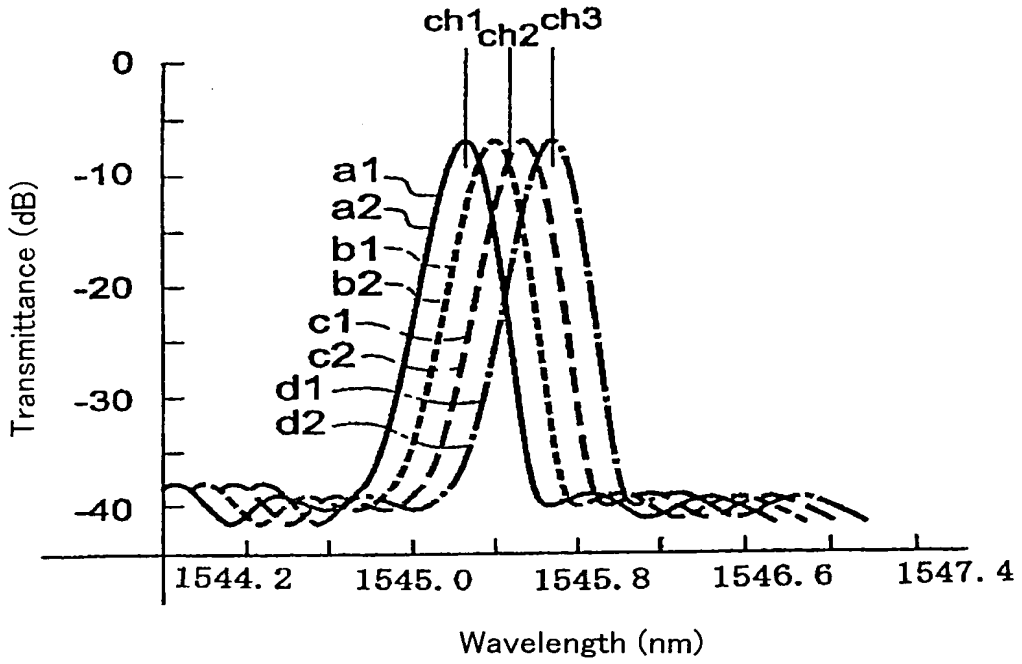


FIG.1-11-B

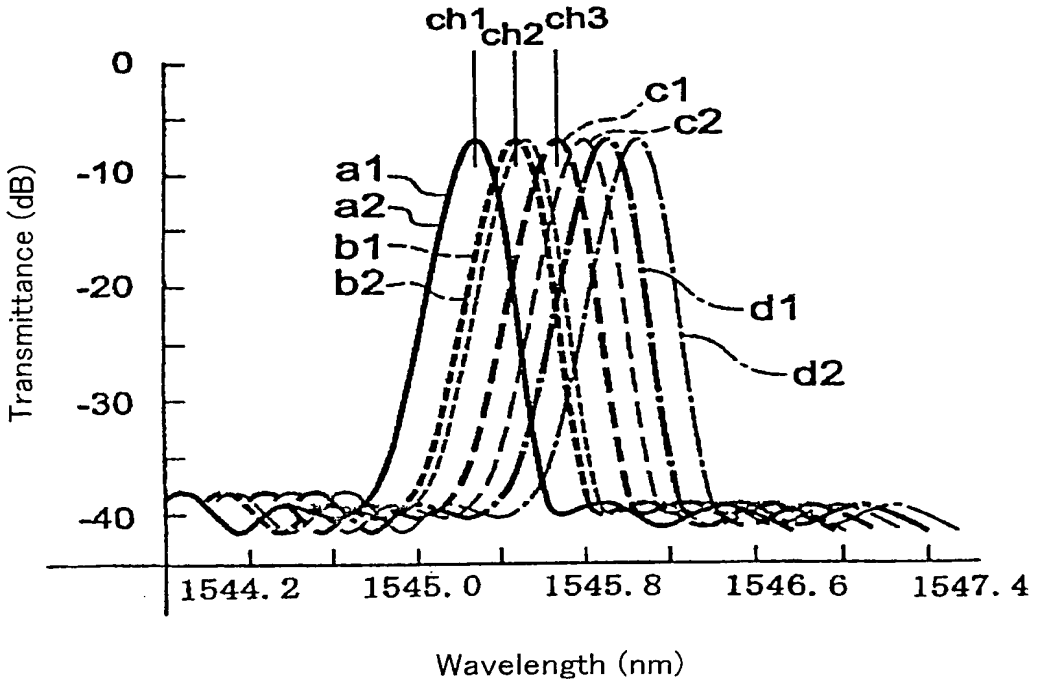
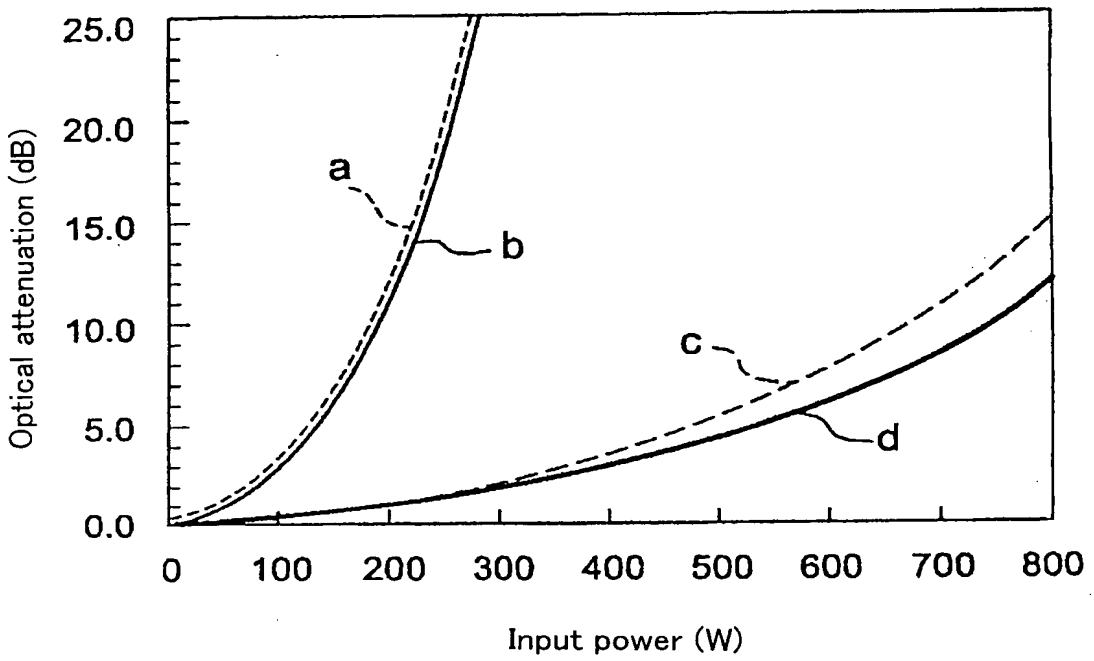


FIG.1-12


25.0
20.0
15.0
10.0
5.0
0.0
Optical attenuation (dB)
a
b
c
d
0
100
200
300
400
500
600
700
800
Input power (W)

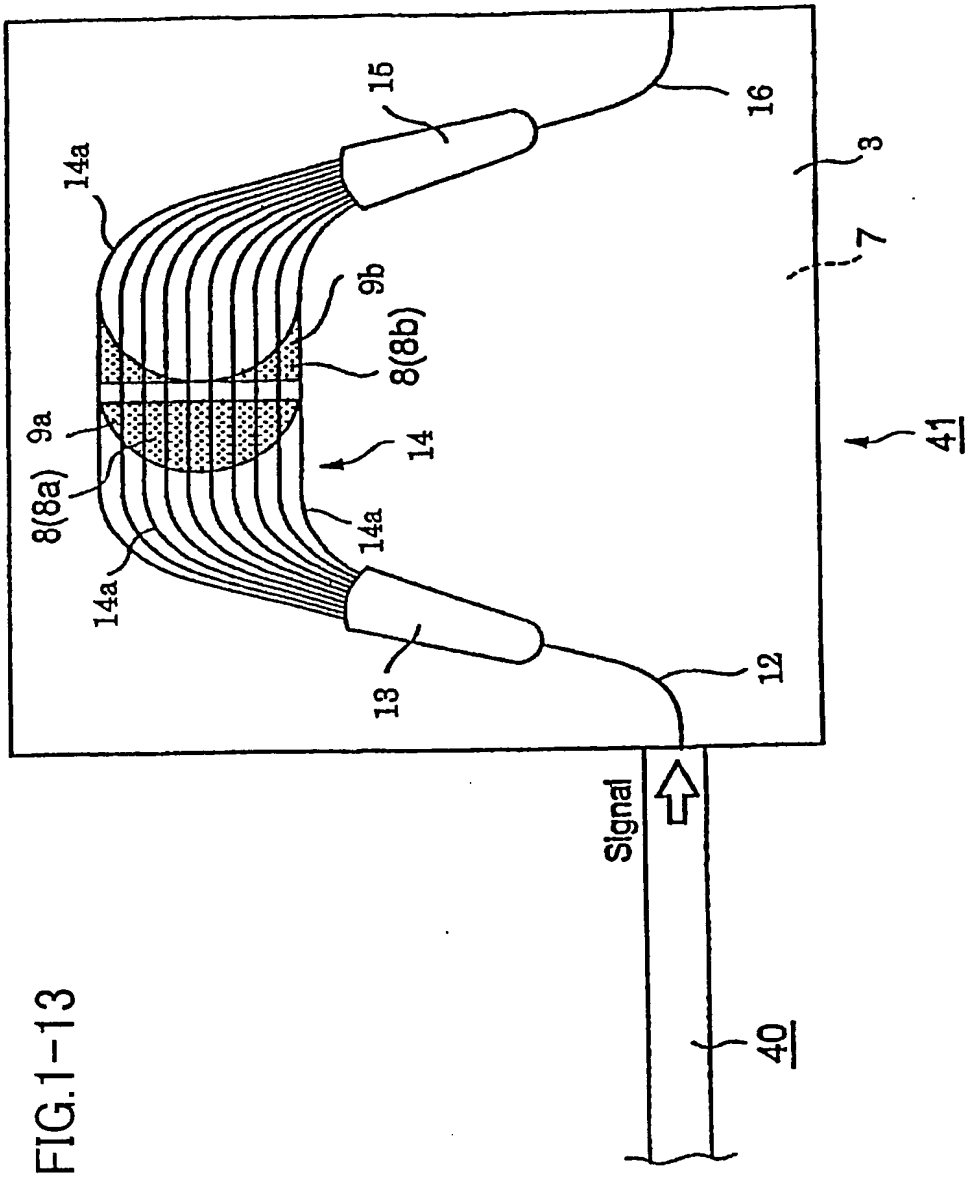


FIG.1-13

FIG.1-14

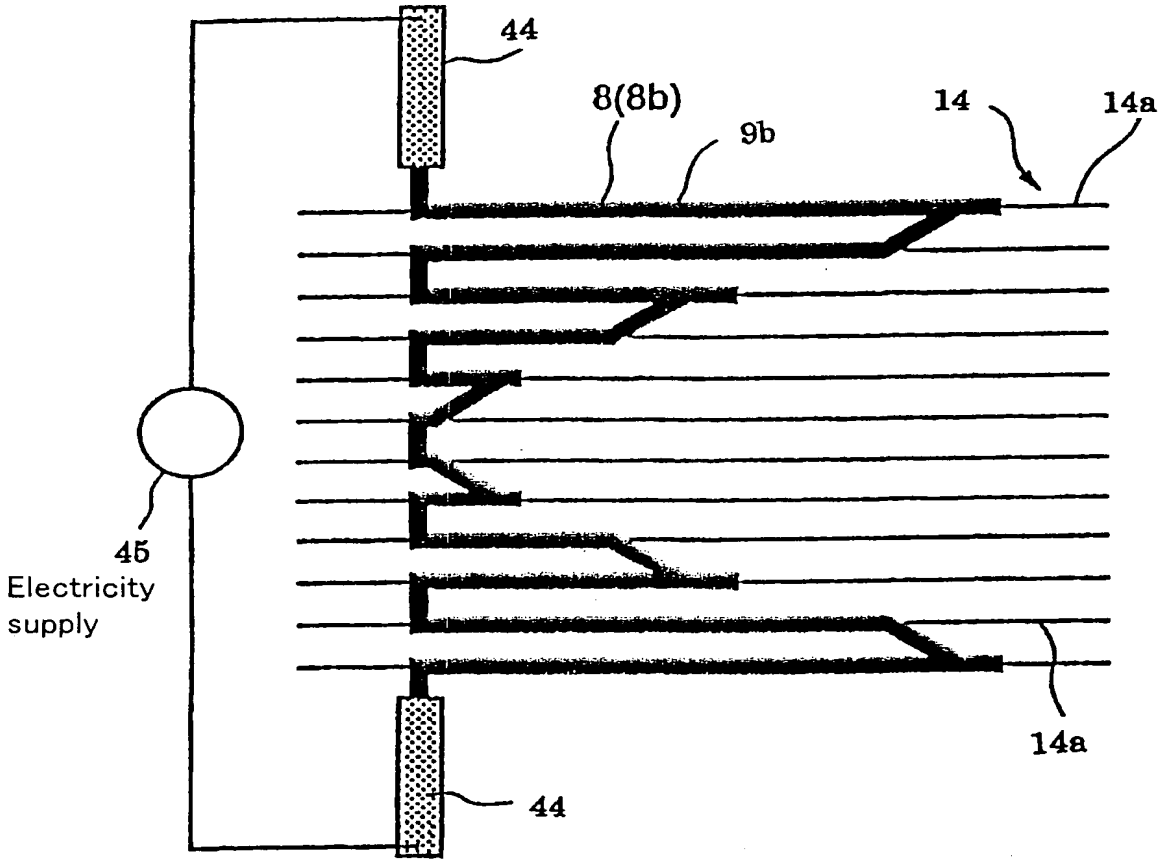


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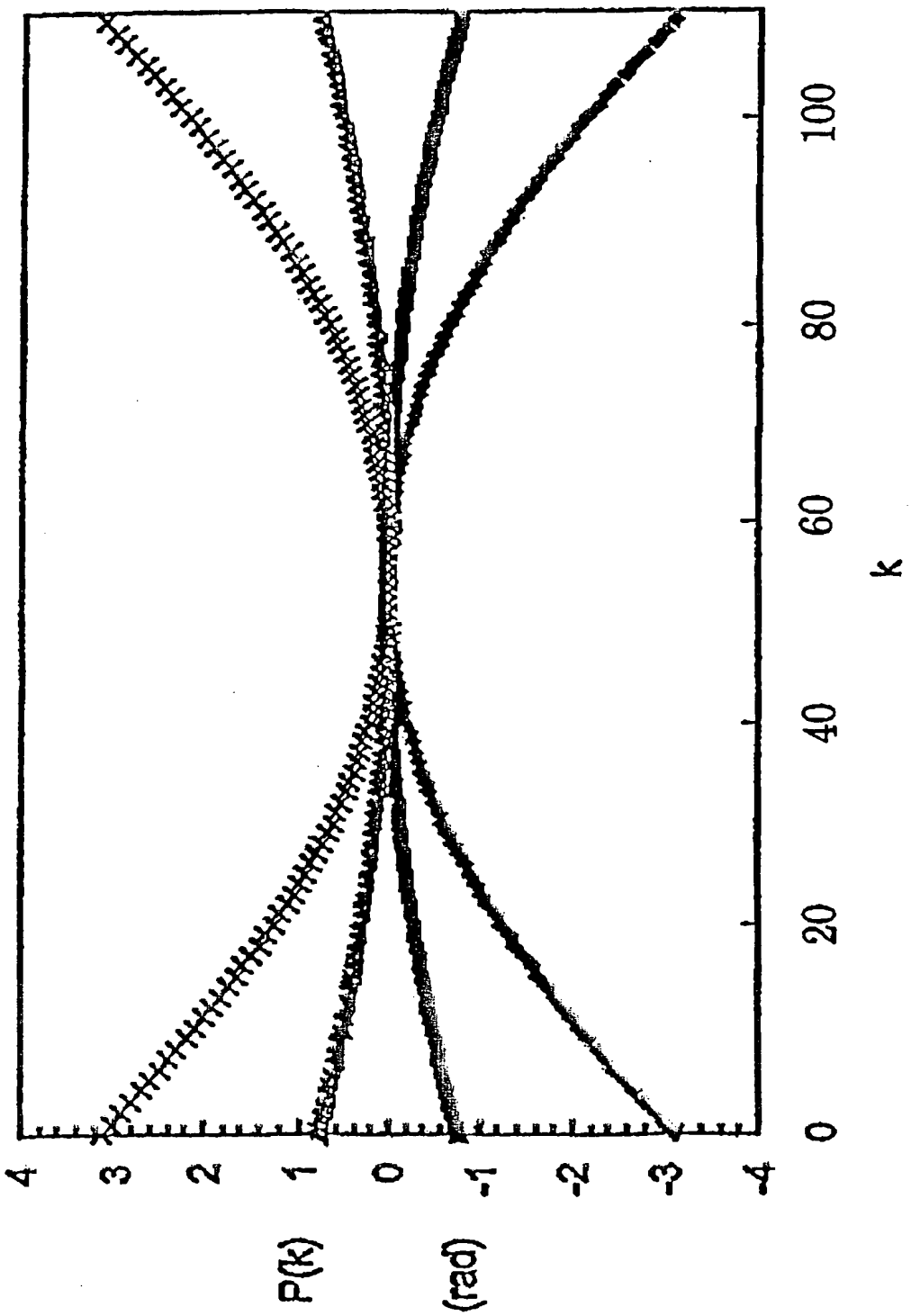
FIG.1-15



BEST AVAILABLE COPY

FIG.1-16

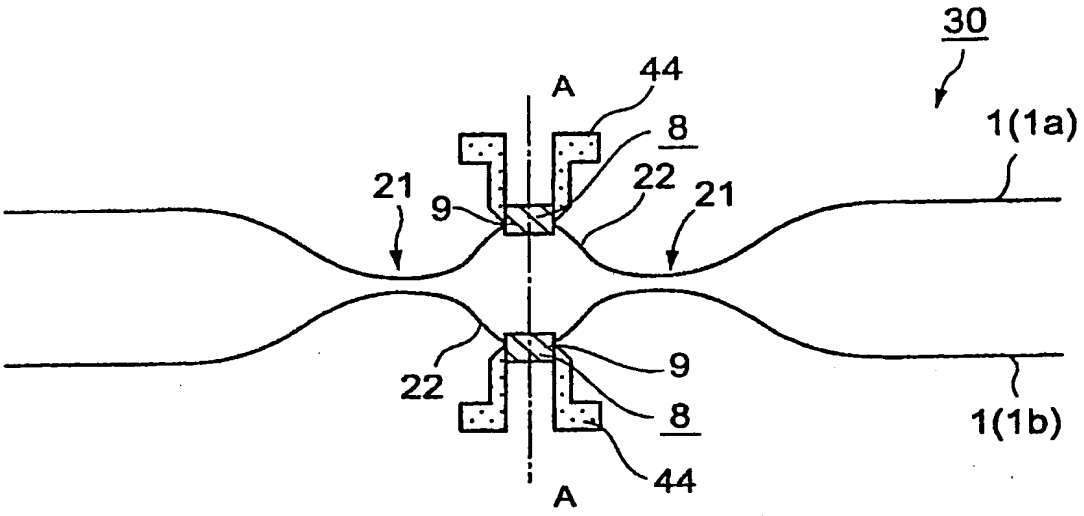


FIG.1-17

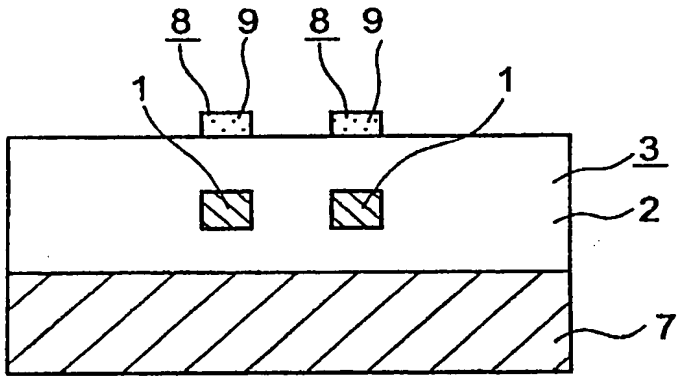


FIG.1-18

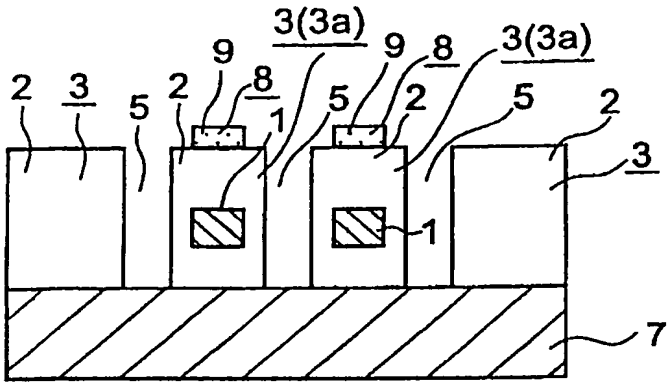


FIG.1-19

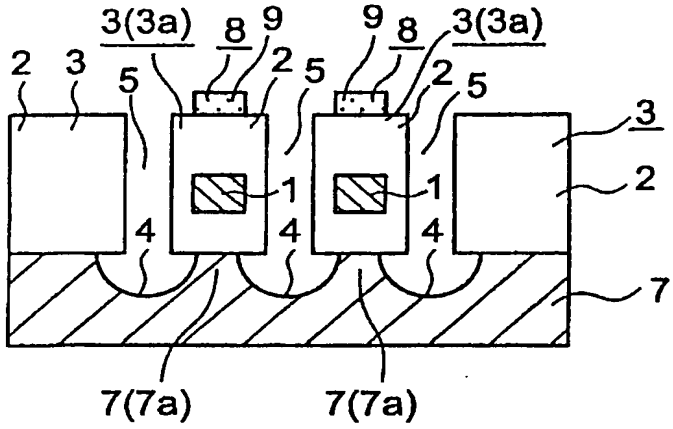


FIG.1-20

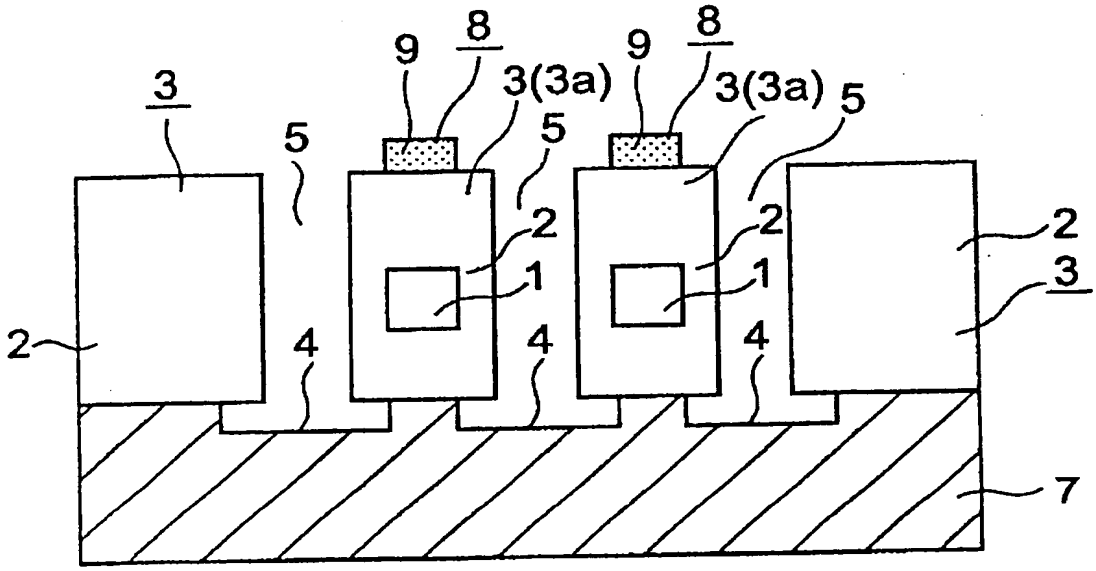
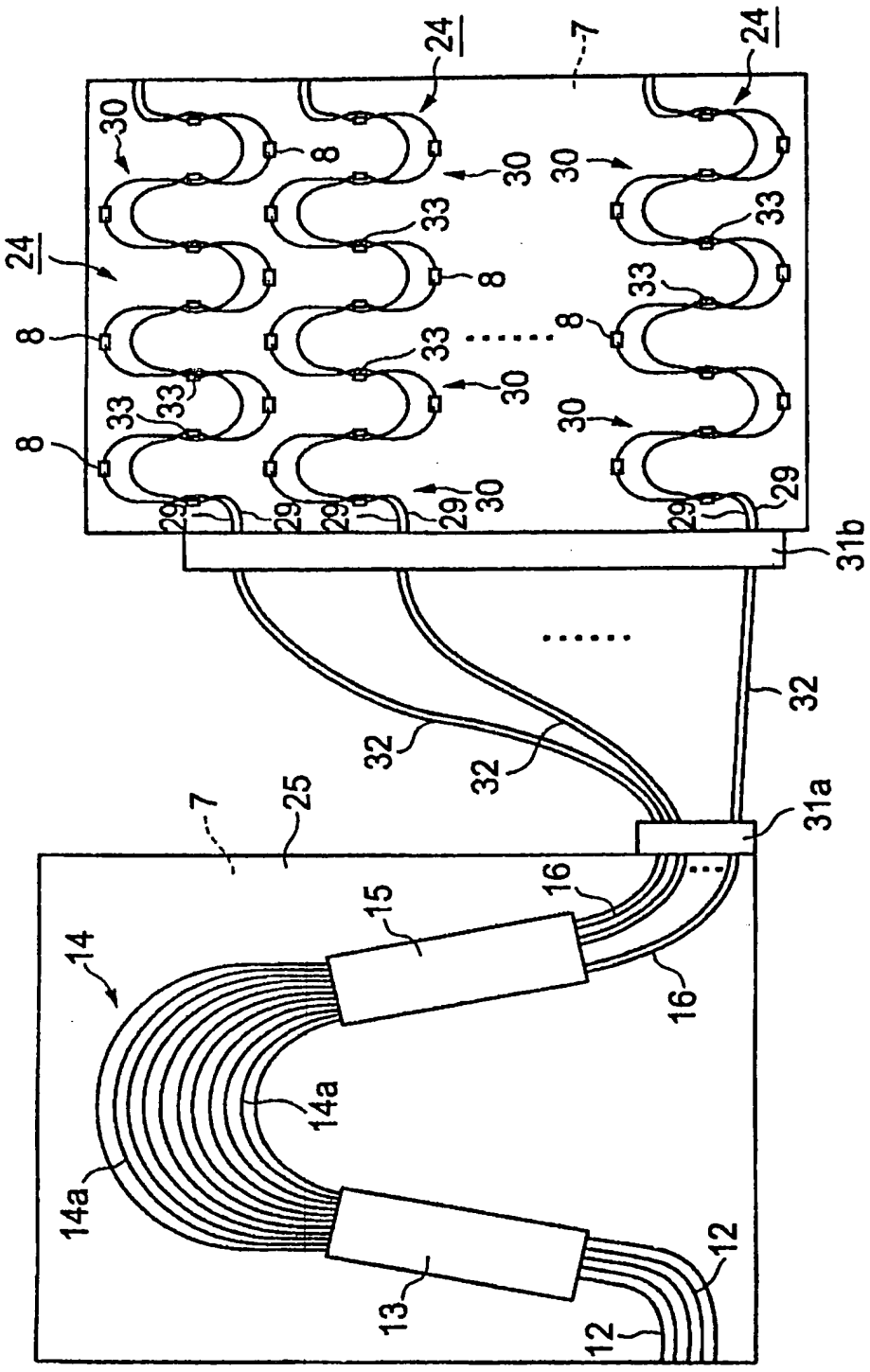


FIG.1-21


24
7
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33
24
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33
8
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33
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33
30
8
33
33
30
30
8
29
29
29
29
30
29
29
31b
32
32
32
7
25
31a
16
15
14
16
14a
14a
12
13
12

FIG.2-1-A

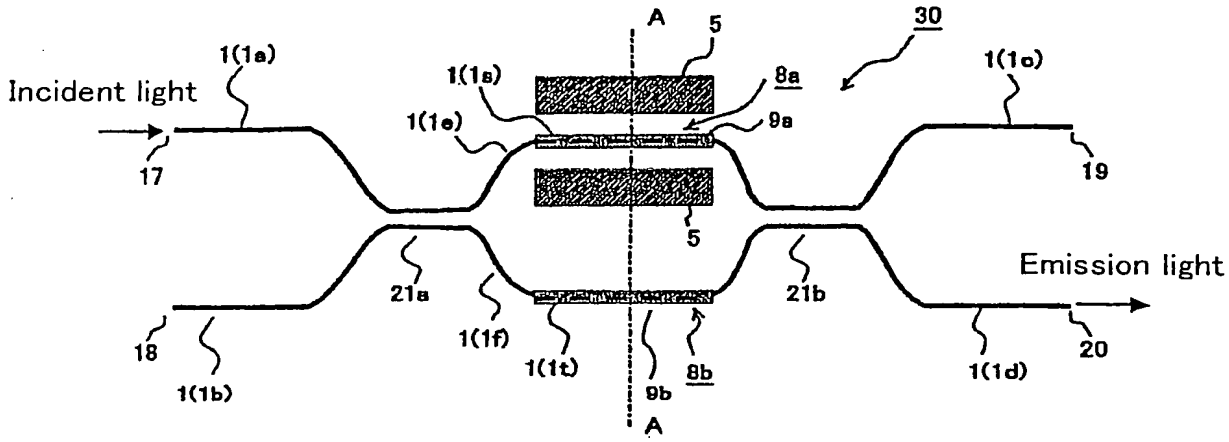

FIG.2-1-B

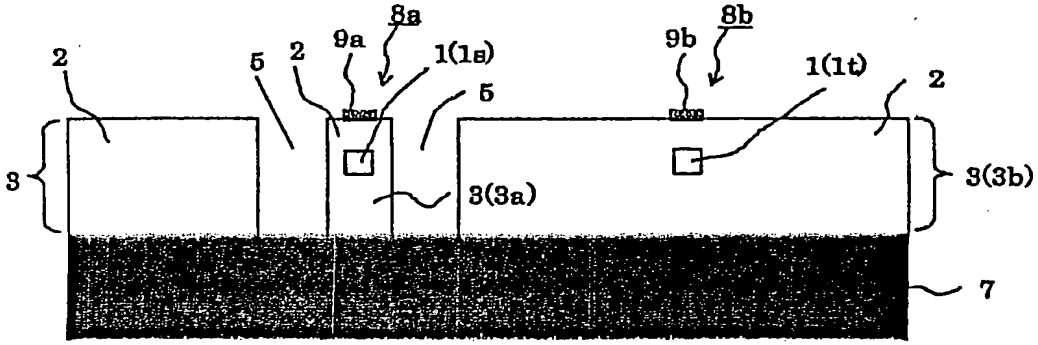

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FIG.2-2-A

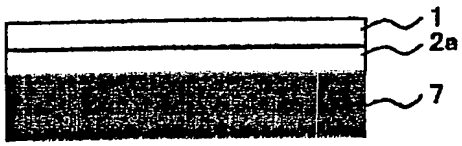

FIG.2-2-B

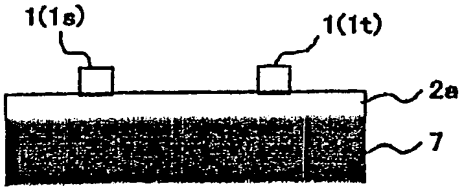

FIG.2-2-C

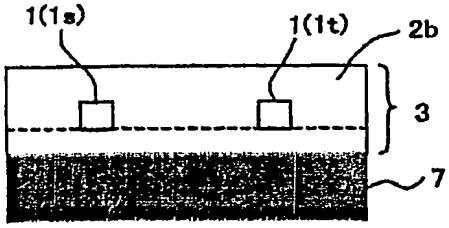

FIG.2-2-D

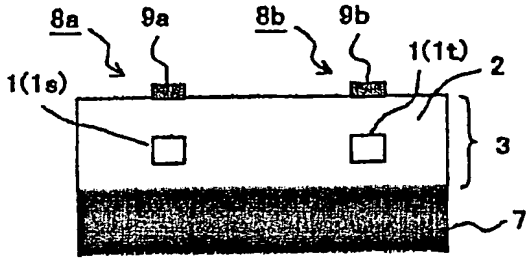

FIG.2-2-E

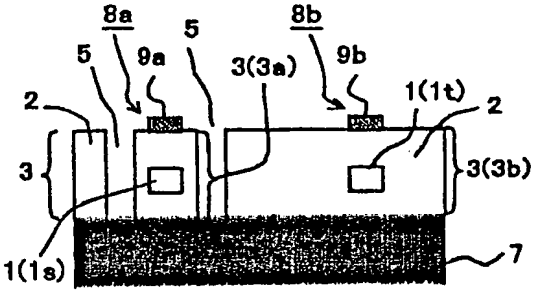

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FIG.2-3-A

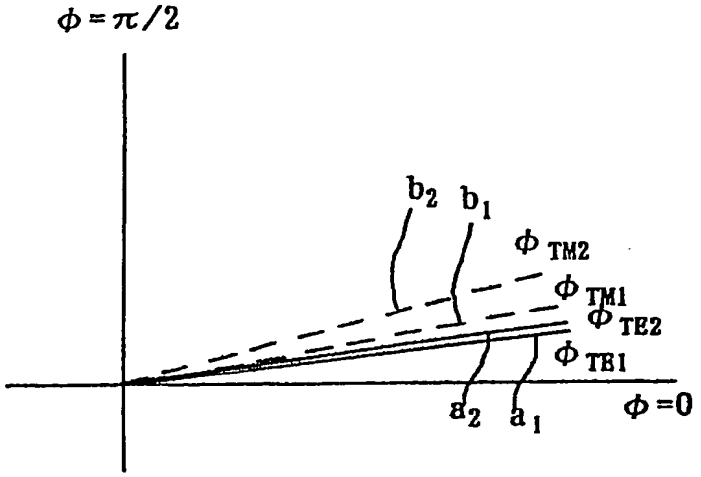

FIG.2-3-B

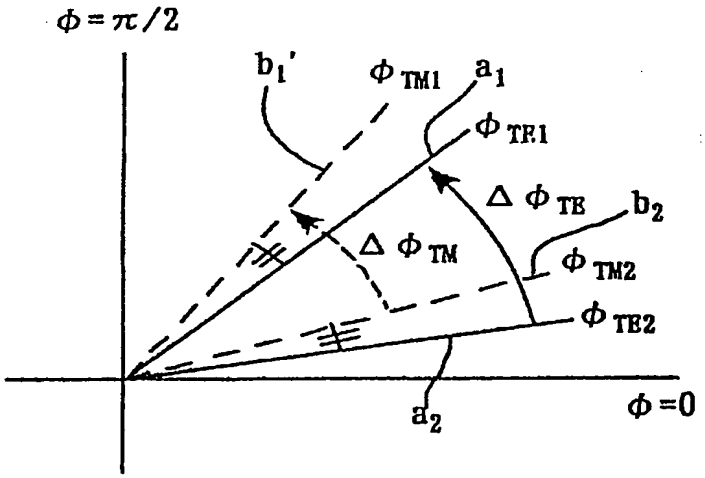

FIG.2-3-C

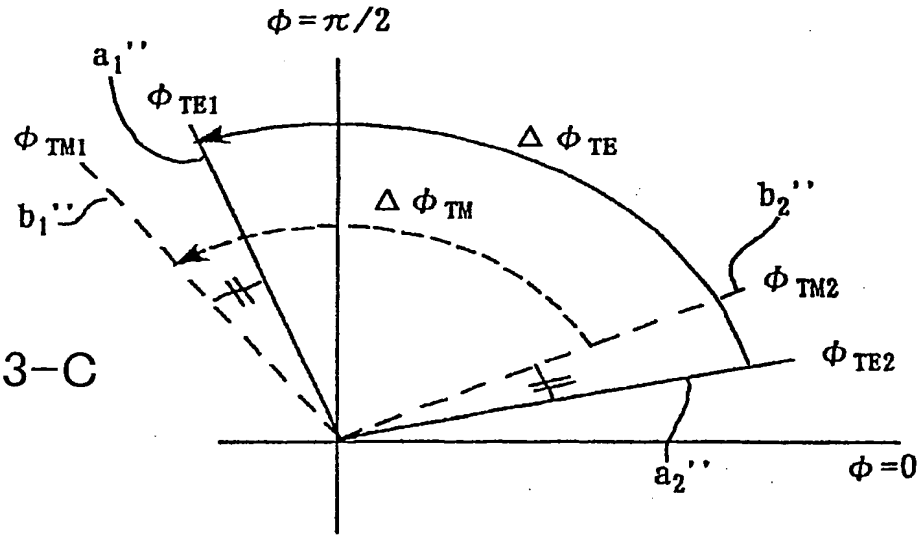

FIG.2-4-A

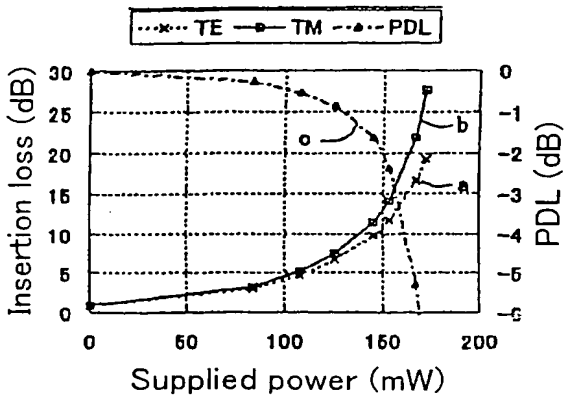

FIG.2-4-B

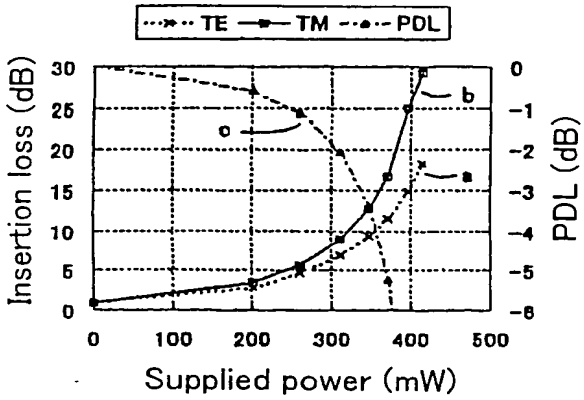

FIG.2-5-A

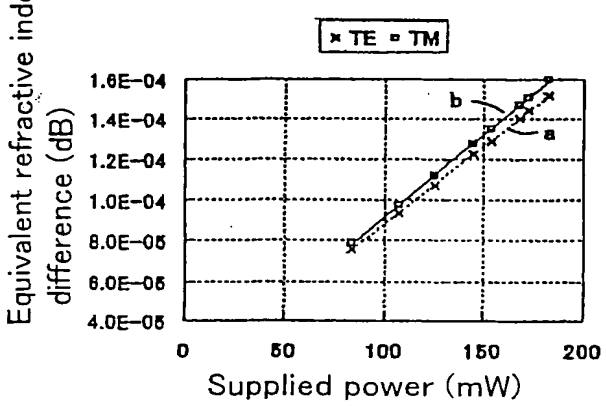

FIG.2-5-B

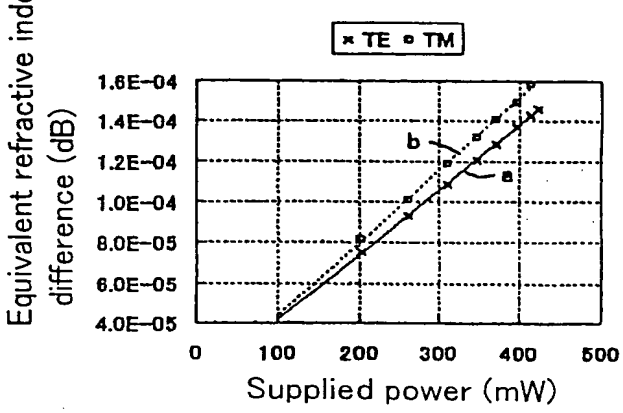

FIG.2-6

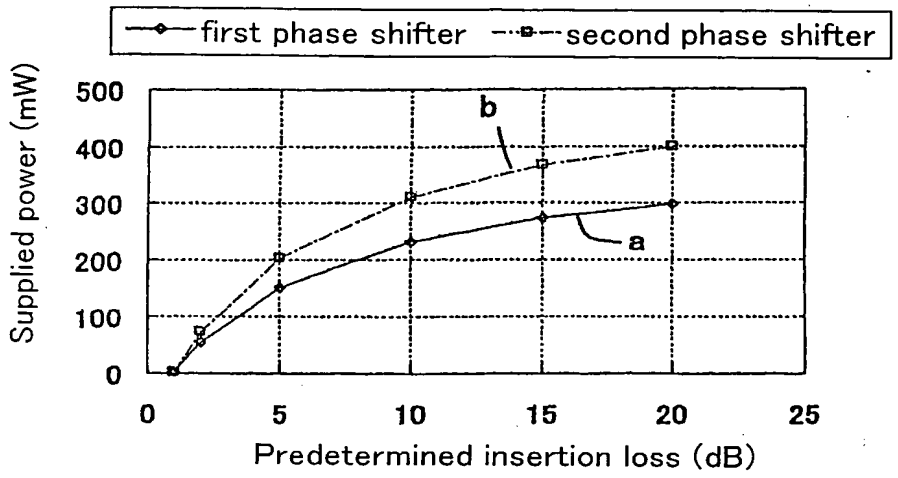
first phase shifter
second phase shifter
Supplied power (mW)
500
400
300
200
100
0
b
a
0
5
10
15
20
25
Predetermined insertion loss (dB)

FIG.2-7

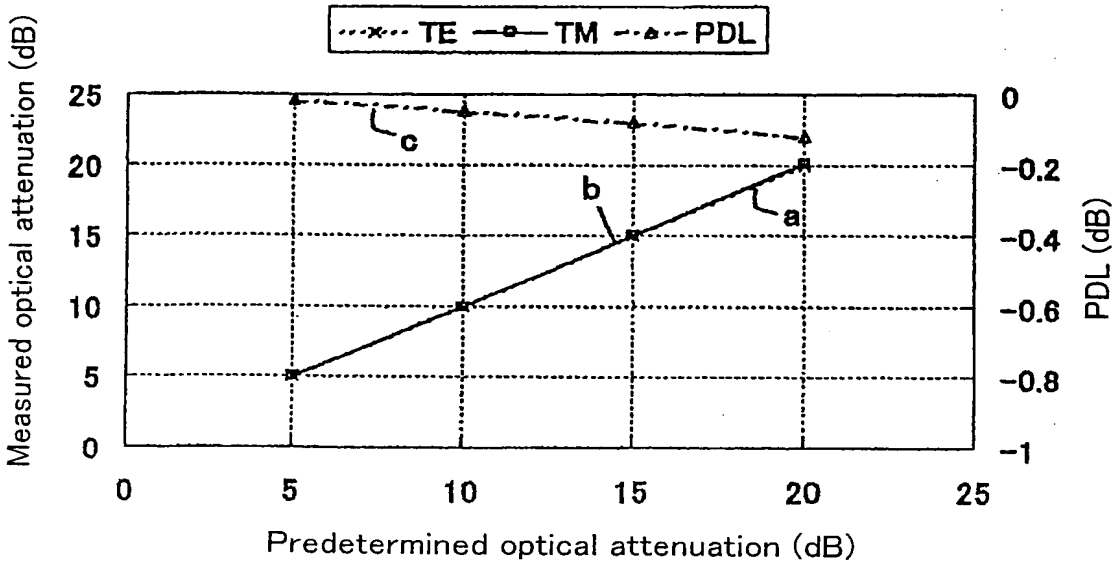
TE
TM
PDL
Measured optical attenuation (dB)
25
20
15
10
5
0
c
b
a
0
-0.2
-0.4
-0.6
-0.8
-1
PDL (dB)
0
5
10
15
20
25
Predetermined optical attenuation (dB)

FIG.2-8-A

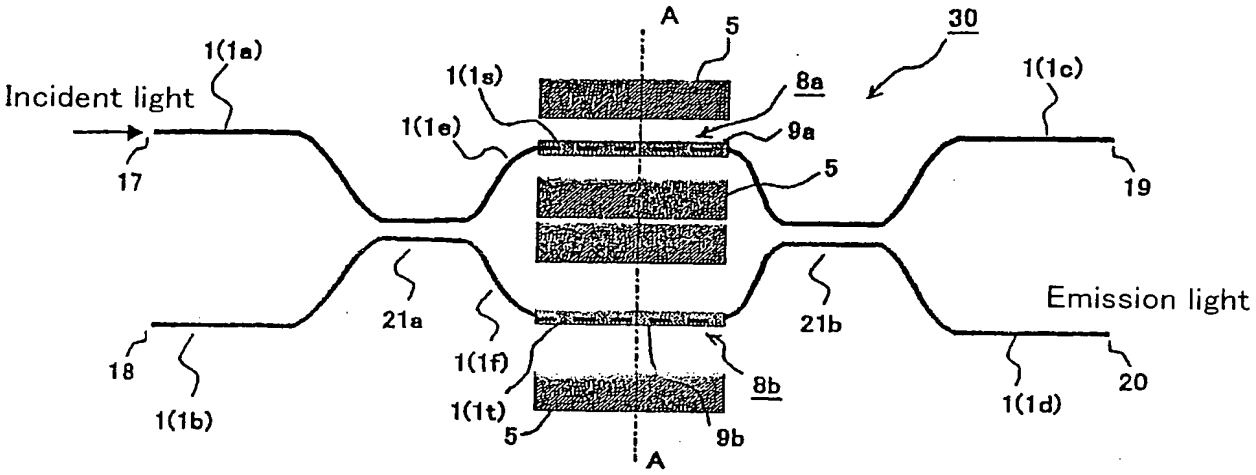

FIG.2-8-B

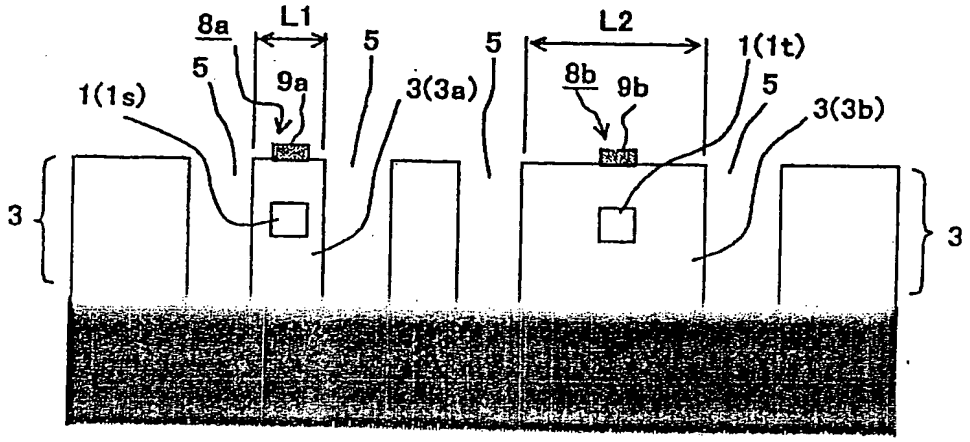

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FIG.2-9-A

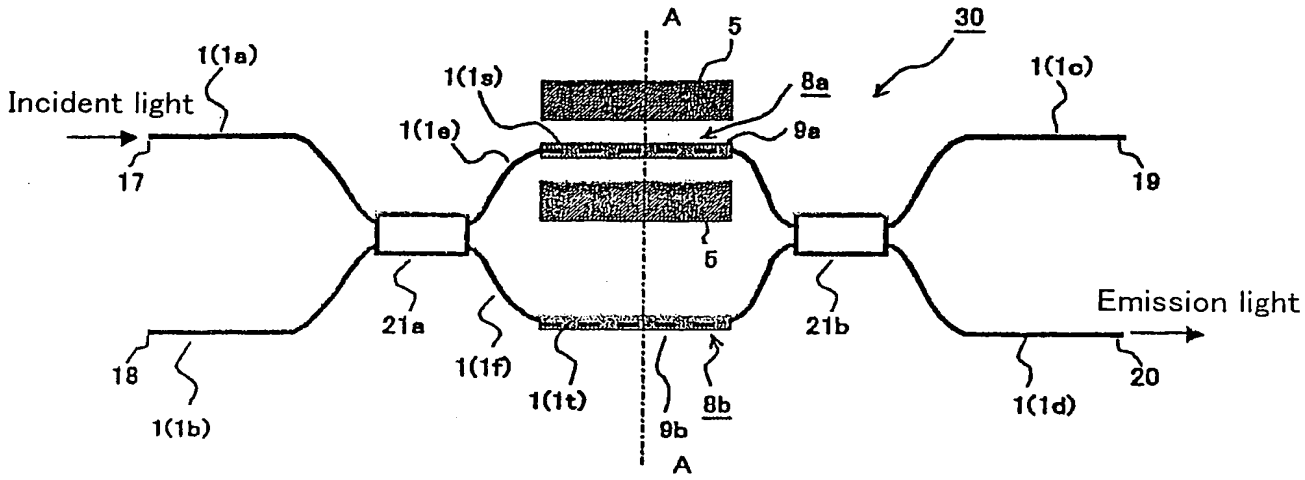

FIG.2-9-B

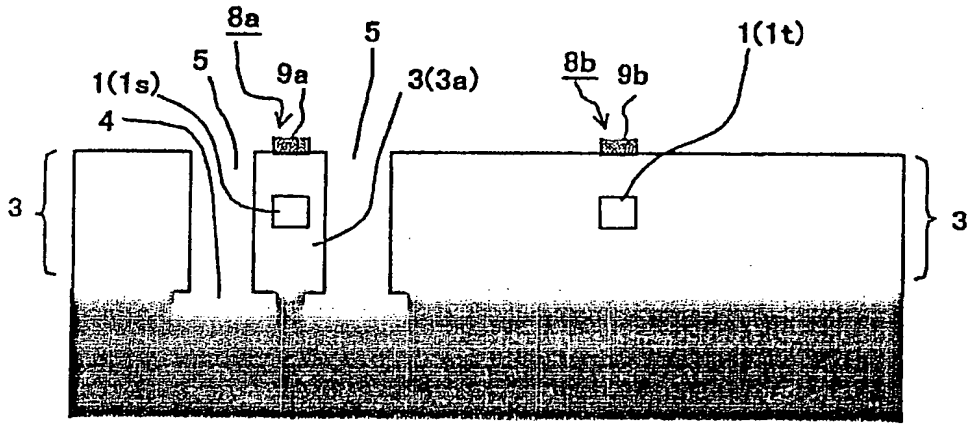

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FIG.2-10-A

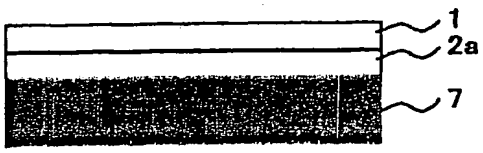

FIG.2-10-B

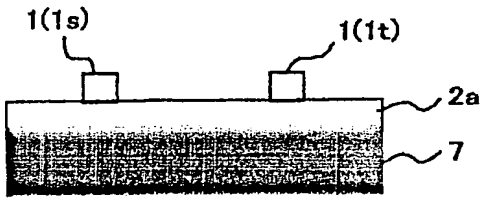

FIG.2-10-C

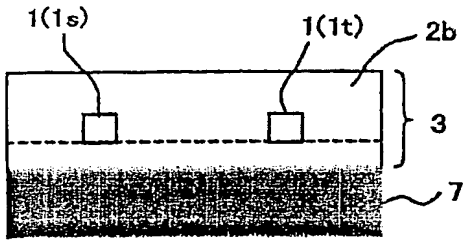

FIG.2-10-D

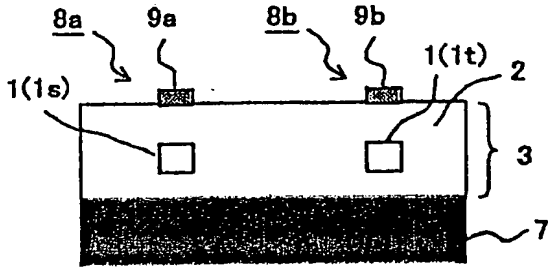

FIG.2-10-E

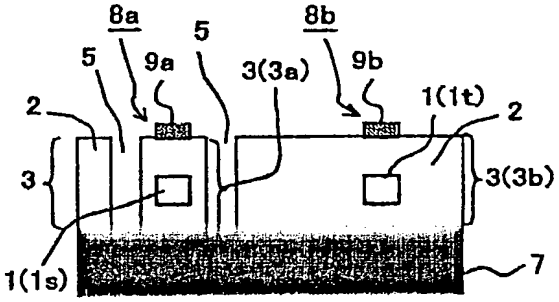

FIG.2-10-F

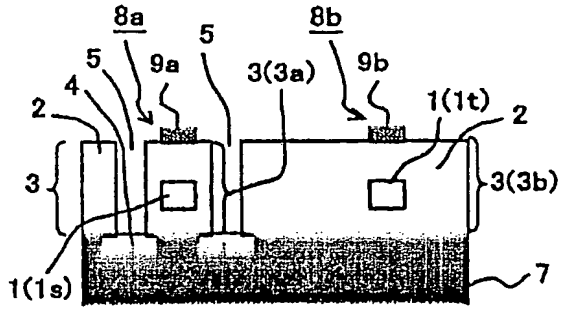

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FIG.2-11-A

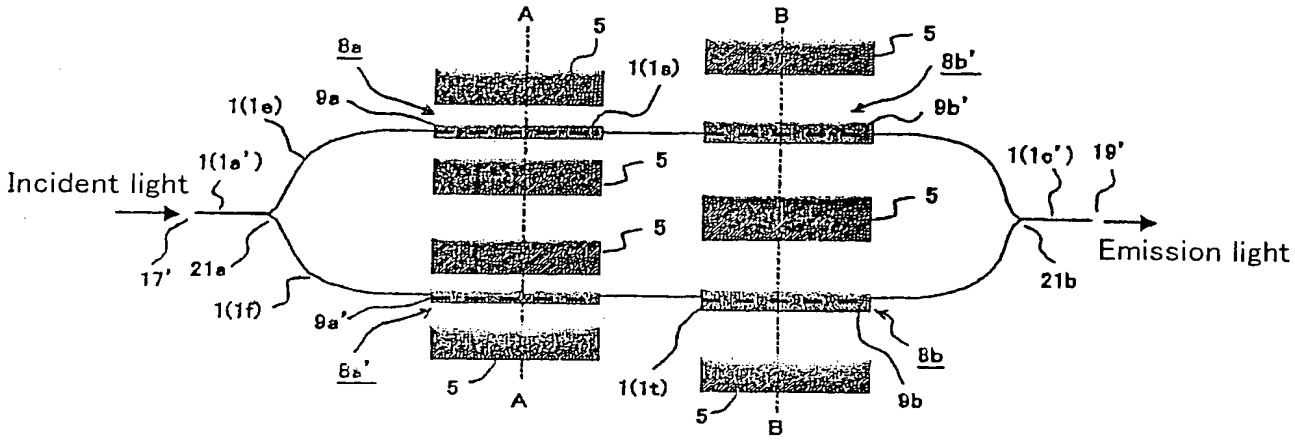

FIG.2-11-B

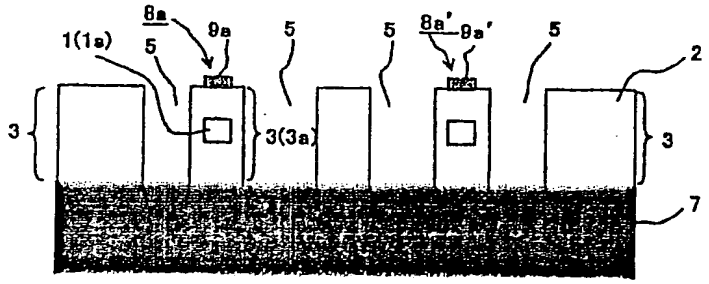

FIG.2-11-C

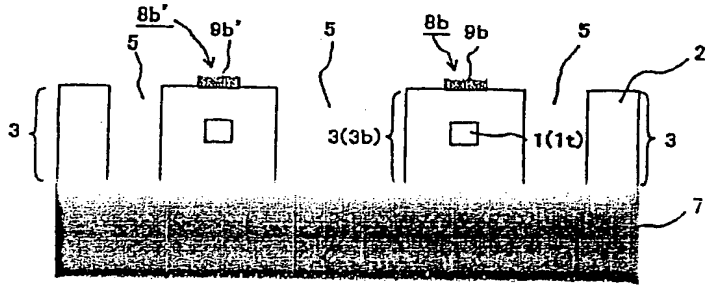

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FIG.2-12-A

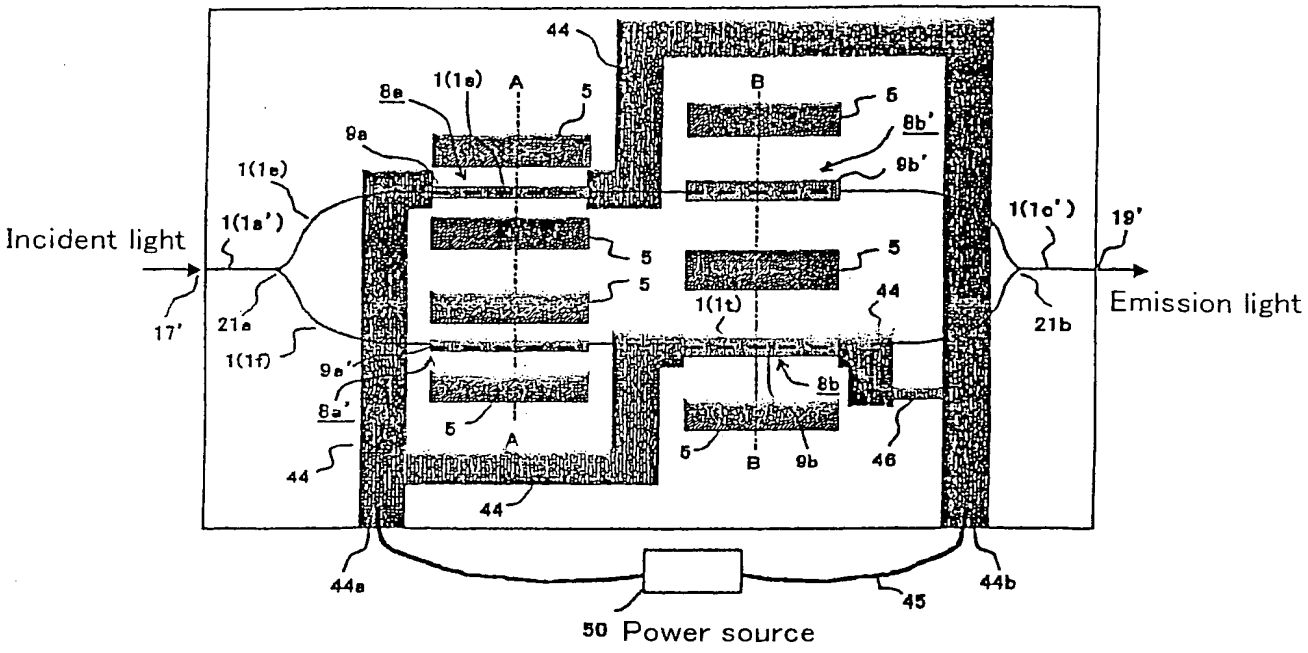

FIG.2-12-B

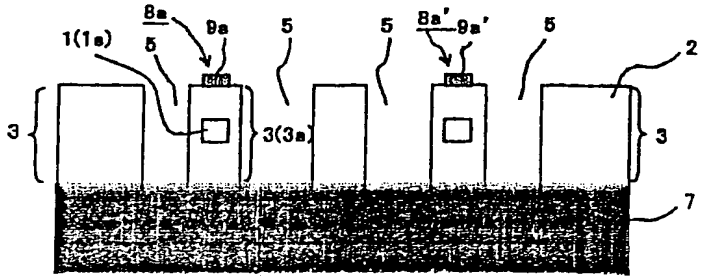

FIG.2-12-C

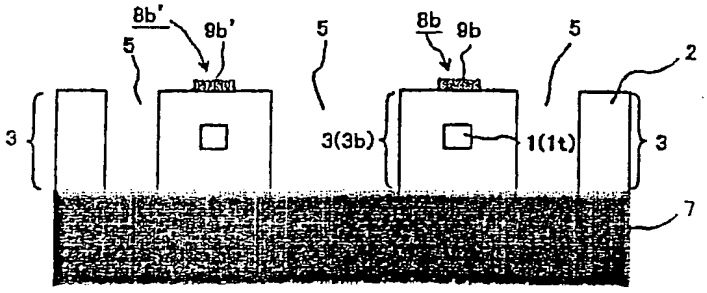

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FIG.2-13-A

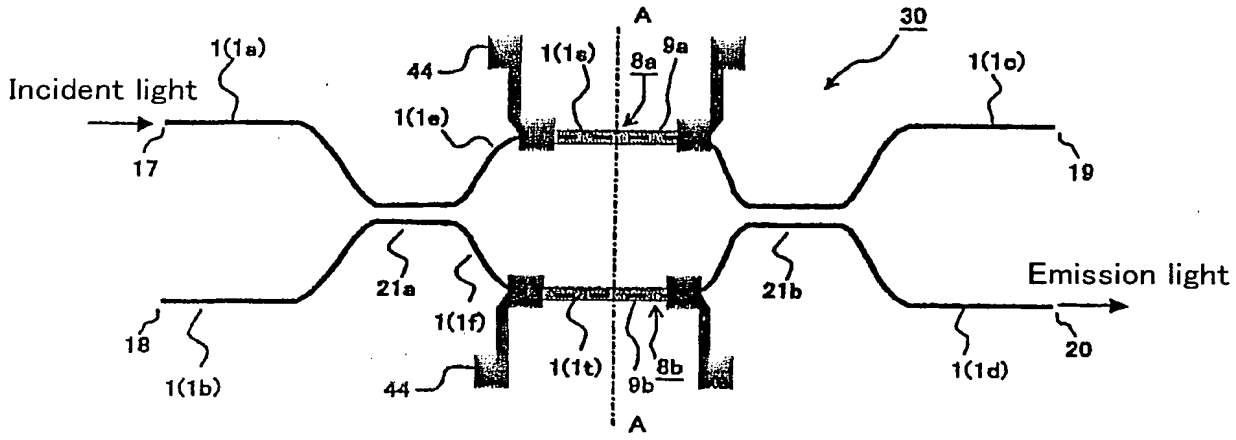

FIG.2-13-B

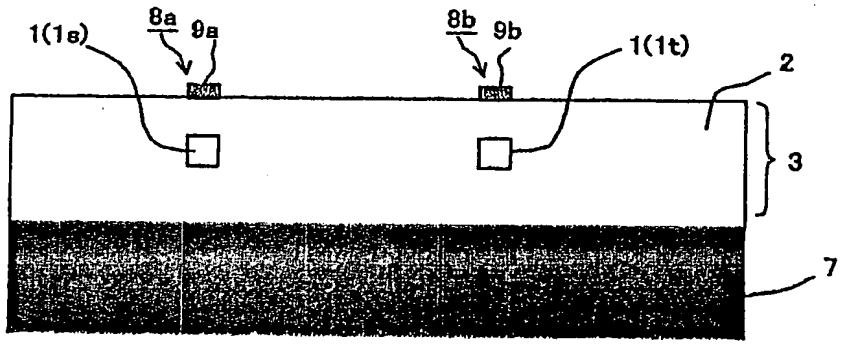

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FIG.2-14-A

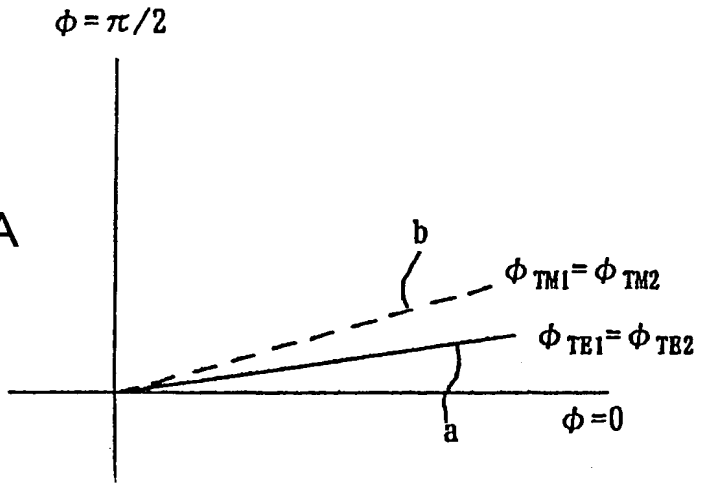

FIG.2-14-B

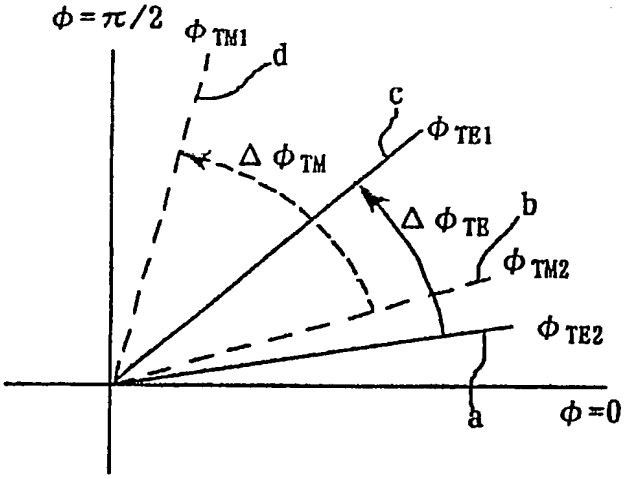

FIG.2-14-C

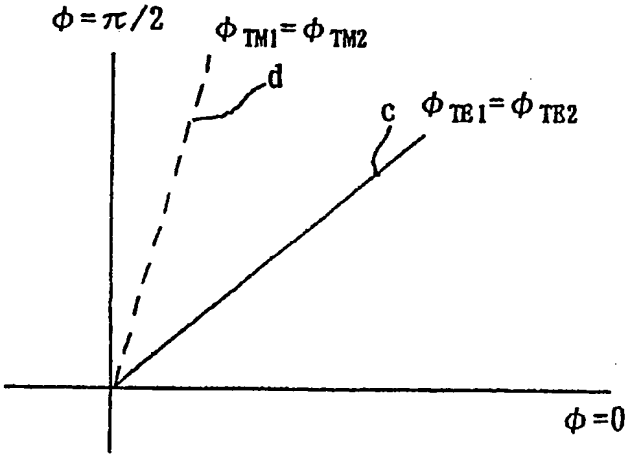

FIG.2-15-A

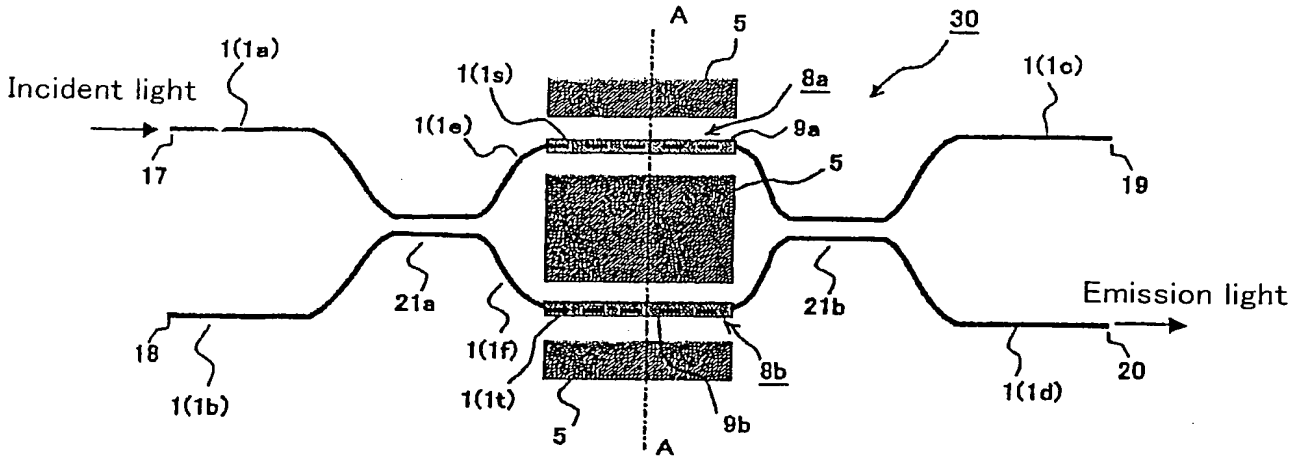

FIG.2-15-B

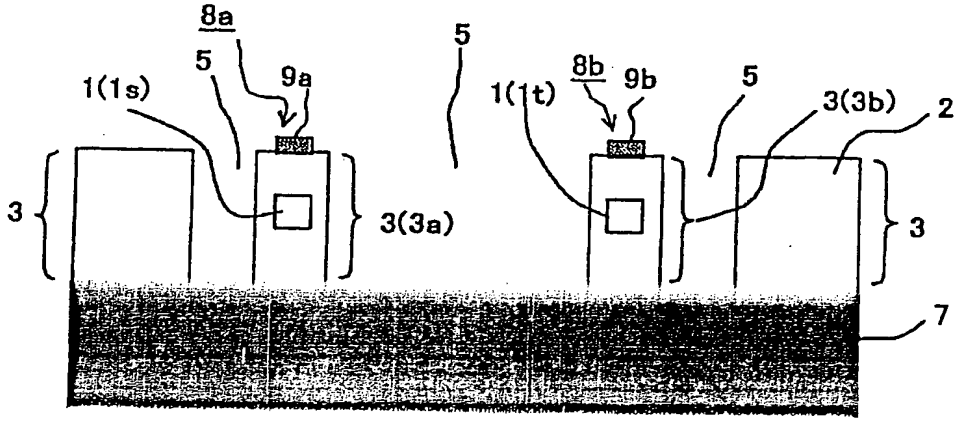

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FIG.2-16-A

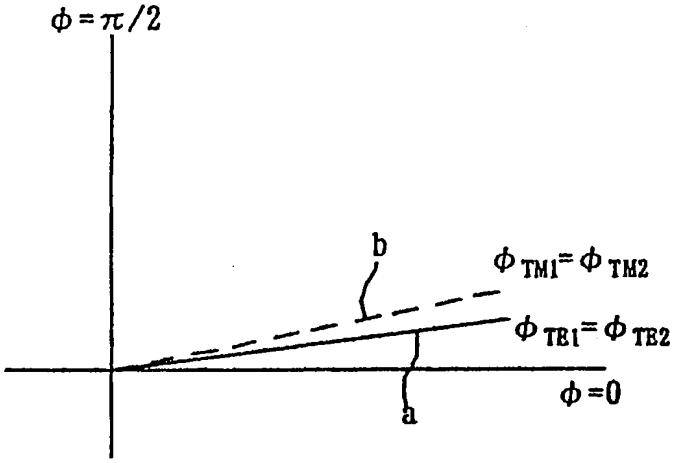

FIG.2-16-B

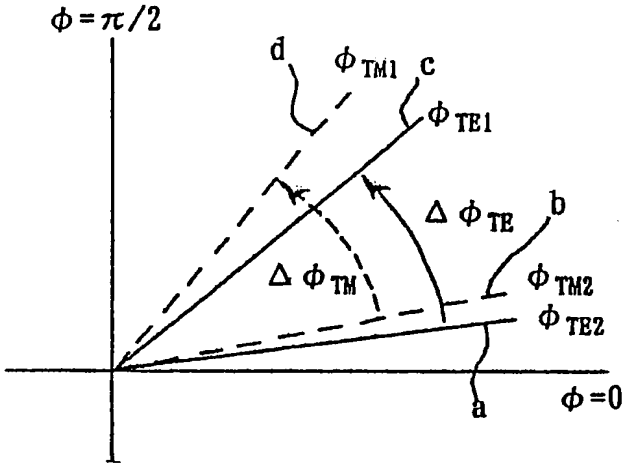
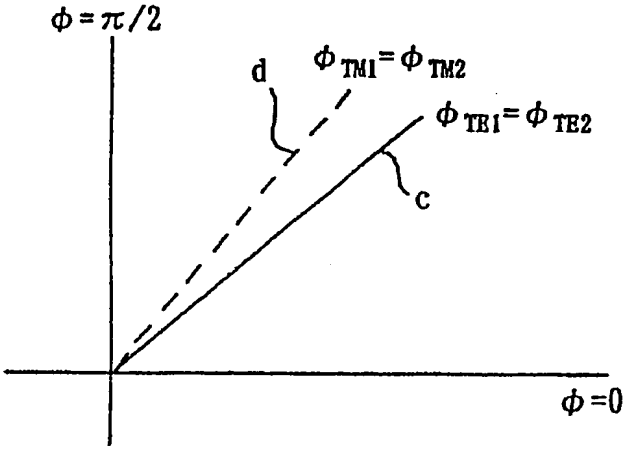
FIG.2-16-C